INSTRUCTION MANUAL

EVER®
POWER SYSTEMS

INSTRUCTION MANUAL
SPECLINE 700

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INTRODUCTION

Thank you for purchasing the EVER SPECLINE UPS power supply unit. It belongs to our most modern, state-of-the-art series of technologically advanced power supply units, which is primarily intended for securing the uninterrupted operation of central heating boilers, fireplaces with water jackets, pumps, and solar systems. The installation of a unit from this series guarantees correct operation for many hours in the event of a power outage, thanks to the series connection of battery module modules. In battery operation mode, the Clear Digital Sinus (CDS) system enables the equipment to generate a sinusoidal waveform at output.

Specline series UPS units have been designed in such a way as to best meet all of your expectations regarding protection against the consequences of power outages. The power supply units are manufactured in Poland, in full compliance with the requirements introduced for the **CE** mark.

GENERAL INFORMATION

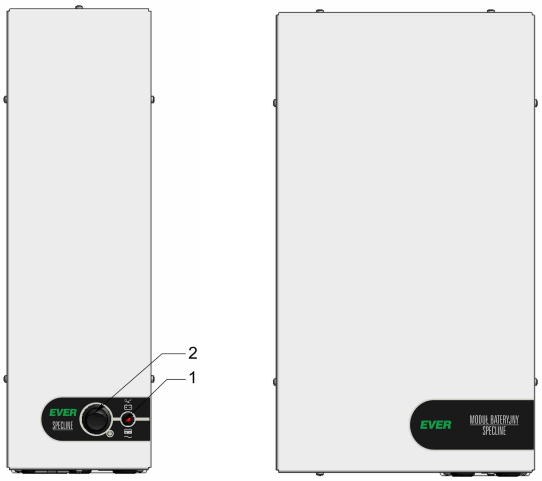
INTENDED APPLICATION OF THE POWER SUPPLY UNIT

The EVER SPECLINE 700 power supply unit protects all equipment that is connected to it against voltage decays and drops, and eliminates the possibility of damage arising from overvoltage in the mains. Its primary application is to secure the operation of central heating boilers, fireplaces with water jackets, solar systems, as well as control and automatic control engineering systems, which require extended support times. It can also be used to power telecommunications equipment (exchanges, faxes) and alarm systems. If you need to protect other, specific receivers, please contact our technical support department.

GENERAL DESCRIPTION OF THE POWER SUPPLY UNITS

- the **CLEAR DIGITAL SINUS system** generates an input voltage with a perfect sinusoidal shape. This solution offers more opportunities to connect devices that are sensitive to the supply voltage waveform, e.g.: laboratory equipment, telecommunication devices;
- synchronisation with the mains;
- **“cold start”** – the unit can be started without being connected to the mains;
- discharged battery sound indication;
- intelligent charging method **Cool Battery Charging (CBC**), which extends battery life - a novel charging method using the components of the internal inverter;
- microprocessor control of all parameters;
- overload resistance;
- short circuit protection;
- system of passive mains filters;
- possibility of connecting up to three battery module or a car battery
- with a capacity up to 150 Ah;
- convenient and universal method of cable connection;
- 24 month guarantee;

STRUCTURE OF THE POWER SUPPLY UNIT WITH A BATTERY MODULE

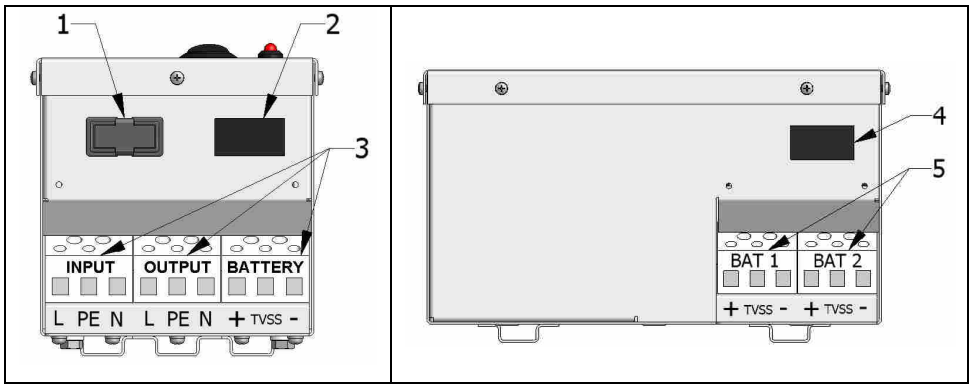


UPS BATTERY MODULE

FRONT PANEL

1. The red signalling diode depicts various operating modes of the power supply unit, symbolically expressed by means of graphical symbols:
   a) red diode continuously on: **mains power mode.**
   b) red diode flashing every 2.5 sec.: **battery charging mode.**
   c) red diode flashing and an intermittent sound signal: **battery operation mode**; if the signal becomes continuous, this means that the UPS will shut down in max. 30 sec.
   d) red diode flashes rapidly and the sound signal reaches a high pitch: **an overload or short-circuit condition.**

2. Main switch – in the event of a power outage or when the power supply unit is not connected to the mains, it starts the power supply unit in battery operation mode – cf. also “cold start”.



CONNECTION PANEL – POWER SUPPLY UNIT

1. AC input fuse socket (mains)
2. DC input fuse socket (battery module)
3. Screw connection terminals of the power supply unit (INPUT, OUTPUT, BATTERY)

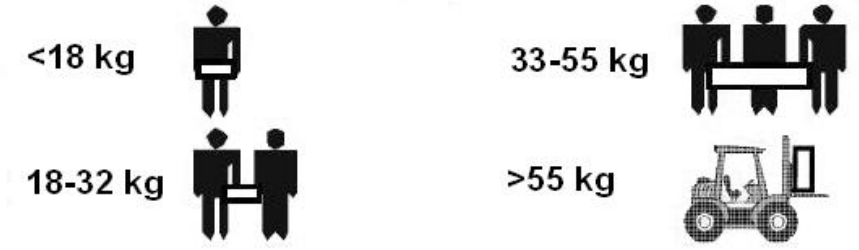
CONNECTION PANEL – BATTERY MODULE

4. DC output fuse socket
5. Screw connection terminals of the battery module

INDUSTRIAL WORK SAFETY INSTRUCTIONS

TRANSPORT

- exercise particular care when moving the appliance;
- heavy appliances must be moved by at least two or more persons;



- the appliance should be operated and stored in conditions concordant with those set in the specification;

ELECTRICAL SAFETY

- The appliance should be operated and stored in conditions concordant with those set in the specification.
- In the event of a brief short-circuit, the high current may cause serious burns.
- Before connecting the appliance, it is necessary to check the technical condition of connectors and cables, as well as that of the appliance itself.
- The appliance must be connected to the mains by means of tri-lead cables; remember to maintain the correct order of connections. Incorrect connections may result in electric shock.
- The appliance channels leak current from the receivers through a protected lead – nevertheless, the total leakage current should not exceed 3.5 mA.
- It is strictly forbidden for the user to perform any repair work, as this would constitute a threat to health and/or life. All repairs and replacement of the battery module must be carried out exclusively by qualified service personnel.
- **If the device is connected to an external power source, the device's output may be live even if the power source is disconnected from the network.**

	NOTE! EVER SPECLINE 700 power supply units are not intended for use with medical equipment or with health or life support systems in particular.

INSTALLATION

UNPACKING

Carry out a visual inspection of the power supply unit immediately upon delivery. Although the product is solidly packaged, the appliance could have been damaged due to shocks experienced during transport. If any damage is determined, inform the carrier or seller.

SELECTING THE POINT OF INSTALLATION

When selecting the place and method of installation, you should take into consideration the high weight of the appliance. The UPS should only be used in rooms where the dust, temperature, and humidity levels are within the device's specifications. Appropriate cooling conditions must be ensured for the UPS to work properly. For this reason, ventilation openings of the UPS must be uncovered at all times, and the distance between the UPS and other objects should not be less than 15 cm.

The distance between the power supply unit and the battery modules or battery should be as small as possible. This makes it possible to use shorter connection cables, thereby helping to limit cable losses.

NOTE! It is forbidden to install the appliance near flammable materials!

Due to the type and placement of fuses in the power supply unit, it is recommended that the protection systems in the building's electric system be used as one of the protection levels. **This is necessary to ensure the short circuit protection of the power supply unit.** The parameters of the building's electric wiring system protection should be selected in accordance with the type and magnitude of the load connected to the wiring system. In extreme cases, different protection parameters of the building and power supply unit’s systems may cause the former to be activated more rapidly.

FIRST START-UP

NOTE! Once unpacked, the appliance should be placed in its working location and connected to the mains. Next, switch the power supply unit on by means of a switch on the front panel in order to charge the batteries. The batteries will be fully charged after approx. 10-48 h (depending on their capacity and existing charge); this fact will be duly signalled by the diode. Now, you can proceed with the remaining installation steps.

The batteries gain full efficiency after more or less one month of mains operation and after three cycles of complete discharge and charging.

In order to verify whether the power supply unit is operating correctly, please perform the following steps:

1. Install the power supply unit in the selected location (e.g. on a wall)
2. Connect the cables to the unit's connectors and the module
3. Install fuses in the sockets
4. Switch the power supply unit on by pressing the switch on the front panel. A correctly operating power supply unit, which is connected to a network with the requisite supply parameters, will signal that it has been switched on by emitting three sound signals, while the diode will flash three times. Now, you should switch the protected device on.

In order to perform a test, switch the mains supply of the UPS off (e.g. on the building's switchboard) – the UPS should commence operation in battery mode, while the protected device should function normally. This operating mode is signalled by the simultaneous flashing of the red diode and an intermittent sound signal. If after switching the mains supply on the diode starts to flash rapidly and an intermittent sound signal is emitted, this means that the load connected to the unit is too great (the power supply unit will operate for approx. 5 sec. and turn itself off). It will be necessary to disconnect the excessive load.

5. Reconnect the mains supply – after approx. 3 sec., the diode will return to the "continuous on" state. Once the unit resumes mains operation, the charging circuit will top up the batteries; this will be signalled by the diode switching off briefly, approx. every 2.5 seconds.

Please keep in mind that when the power supply unit is working in battery mode and the red diode starts to flash and the sound signal becomes continuous, the device will shut down in no more than 30 sec.

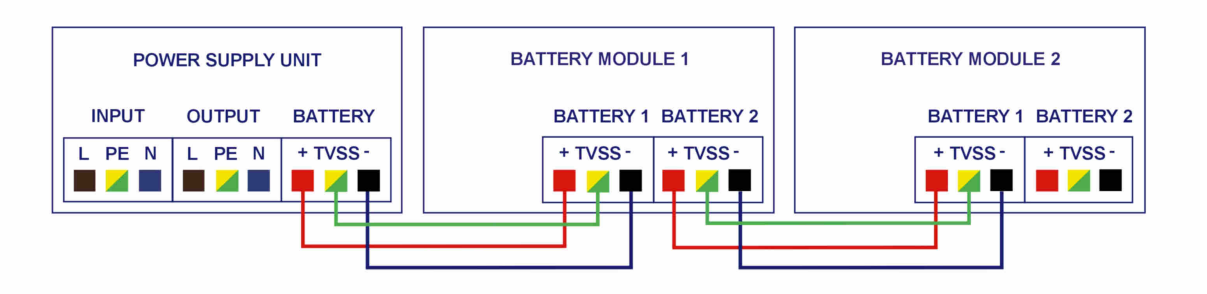
SWITCHING THE POWER SUPPLY UNIT ON WITHOUT A MAINS CONNECTION – "COLD START"

If the mains voltage parameters are incorrect, the unit can be powered on in battery operating mode and supply devices until normal voltage resumes, or until the battery is discharged.

In order to use this function, press the "power on" switch on the front panel. The powered appliance should be switched on. The power supply unit will emit three short signals, informing that it is ready for operation, and will then switch to the battery mode. In the case of EVER SPECLINE 700 units, this is signalled by the flashing of the red diode on the front panel and an intermittent sound signal.

⚠	**NOTE! Since boiler control systems have varying start-up power input requirements, problems may be encountered when attempting to start the UPS and connected devices. If this is the case, you should try to "cold start" the unit again.**

BATTERY MODULE INSTALLATION



CONNECTING BATTERY MODULE

You may connect 1-3 42 Ah battery modules to the power supply unit. Connections should be made with conductors with a minimum section of 2.5 mm^2. The BATERIA 1 (battery module 1) and BATERIA 2 (battery module 2) connectors are connected in parallel. Both the module and power supply unit are delivered with fuses.

For transport and connection, the fuses should be removed from their sockets. They should be installed only after all the connections are made!

CONNECTING THE BATTERY

An lead-acid car battery (12 V) with a maximum capacity of 150 Ah may be connected to the power supply unit.

Connections should be made with conductors with a minimum section of 2.5 mm^2.

For detailed information, please visit www.ever.eu

⚠	**NOTE! Please pay particular attention to the polarity of the connections (battery "plus" to the power supply unit "plus", battery "minus" to the power supply unit "minus"); if they are reversed, the unit may be damaged and the guarantee thereby voided.**

DESCRIPTION OF THE OPERATION OF THE POWER SUPPLY UNIT

GENERAL INFORMATION

The fundamental role of the power supply unit is to supply connected devices with electricity from the attached battery modules or an external battery in the event of irregularities in the mains supply. The time over which electricity is provided by the unit depends on the capacity of the battery and on the currently connected load. The power supply unit utilises circuits that detect extreme operating conditions, i.e. an overload of the converter and a short-circuit at the input. These circuits are active in the **battery operating mode.**

When the mains voltage parameters are correct, the power supply unit switches to **mains operation**. In this case, prior to reaching the UPS output, the mains voltage is filtered in the anti-interference circuitry, where additional radio-electric impulses that degrade the mains power quality are filtered out. If the upper or lower input voltage limit is exceeded, or if no input voltage is detected, the unit immediately switches to **battery operation.** The level of discharge of the battery during battery operation is indicated by a sound signal. In the final phase of battery discharge, the signal becomes continuous, thereby indicating that the UPS will switch off shortly (at full power, this is approx. 30 seconds, while at lower power levels – a somewhat longer period). Once mains voltage is restored, the power supply unit switches to **mains operation** and commences the charging process, which is signalled by the diode. When the battery is fully charged, the diode is continuously on. However, in order to ensure permanent readiness, the UPS continues to charge the batteries. In order to increase the life of the batteries, cyclic charging is used in the UPS.

The UPS employs an innovative charging method, typically reserved for high-end power supply units (**CBC – COOL BATTERY CHARGING**), which utilises elements of the internal converter. In the mains operating mode, this function charges the batteries, while in battery operation mode it converts the internal energy of the battery to an alternating voltage that supplies the protected devices.

If you want to turn the power supply unit on without it being connected to the mains, you can switch it on in battery mode (cf. “cold start”).

PROTECTION DEVICES INCORPORATED IN THE POWER SUPPLY UNIT

Overload protection

The UPS indicates an overload for a load in excess of 110% of the UPS rated power. This is signalled only in battery mode. The UPS:

- switches off after 30 seconds in the range 200-400 W
- switches off within 5 seconds above 400 W

The diode on the front panel starts to flash rapidly, while the sound signal becomes intermittent.

Short circuit protection

The power supply unit is equipped with a fusible cut-out on the mains input and an electronic fuse on the output. The electronic fuse operates only in battery mode. Activation of the electronic fuse is indicated by the rapid flashing of the diode. A short circuit is also signalled by a very quick, intermittent sound. Because the battery is connected externally (it is not built-in), additional protection devices have been utilised:

a. Battery overvoltage protection

The power supply unit is protected against the connection of a battery with a voltage greater than nominal. In this case, the car fusible cut-out will burn out.

b. Protection against an incorrect battery connection

The power supply unit is protected against reverse battery connection.

	NOTE! In the event of activation of the overvoltage protection or reverse battery polarisation, the burn-out of the UNIVAL fuse will be accompanied by damage to the protective diode. In this case, please contact the manufacturer's service department for replacement.

Battery overcurrent protection

The power supply unit is protected against exceeding the maximum battery current by two protection devices:

- electronic
- car fuse, UNIVAL type, 19 mm, 40 A

COMMENTS REGARDING OPERATION

	WARNING! EVER SPECLINE 700 power supply units are C2 category appliances. In residential environments, the product may interfere with radio signals, which may require additional precautions to be employed by the user.

FUSE REPLACEMENT

In the event of the connection of a device with a power consumption level that considerably exceeds the nominal value, or a short circuit in the mains socket, the fuses may burn out (the fuses are located in a holder – cf. connection panel). In order to replace a fuse, turn the unit off with the switch, disconnect mains power (e.g. at the building's switchboard), remove the fuse holder, and install a new fuse with parameters that are concordant with the specification of the power supply unit. The set contains one spare mains fuse and one spare battery fuse.

INTERACTION WITH ELECTRICAL GENERATORS

EVER SPECLINE 700 power supply units are VFD-class devices that synchronise themselves with the mains voltage. The unit has been designed to tolerate voltage fluctuations in the range of 184-264 V and changes in the frequency of ±5 Hz in relation to the model frequency of 50 Hz. The generator frequency value may be variable over time and depends on changes in the load values. If the generator voltage frequency changes were to exceed this tolerance, the power supply unit may consider such a frequency value as incorrect and switch to battery operation.

OUTPUTS

The connectors used in the power supply unit have a maximum current of 40 A.

STORAGE, MAINTENANCE, AND TRANSPORT

The power supply unit should be stored in a cool and dry place, and in its working position. It is recommended to store battery modules with fully charged batteries:

- at a temperature between 0℃ ÷ +30℃, the battery should be charged every 6 months;

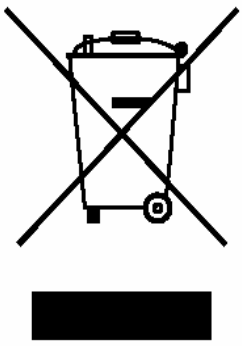
- at a temperature between +30℃ ÷ +45℃, the batter y should be charged every 3 months.

The appliance should be transported in its original packaging, under conditions concordant with those set in the product specification. EVER Sp. z o.o. shall not be liable for mechanical damage arising during the transport of the appliance without its original packaging.

UTILISATION

The appropriate utilisation of used electric and electronic equipment helps protect human health and the natural environment against the negative effects brought about by the presence of hazardous materials and components, and the improper storage and processing of such equipment.

Act of 29 July 2005, on Waste Electric and Electronic Equipment, Article 22.1, Point 1.2.



The crossed out waste container symbol means that, in the European Union, a used product should be handed over to a special waste handling outlet. This concerns both the appliance itself, and all accessories marked with this symbol. Such products should not be disposed of together with unsorted municipal waste.

Method of safe removal of the batteries from the appliance:

The batteries should be removed from the appliance by an authorised service outlet or by a duly authorised electrician.

TECHNICAL PARAMETERS

TYPE / PARAMETERS	POWER SUPPLY UNIT	BATTERY MODULE
MAXIMUM output power (30 sec.)	700 VA / 400 W	
Rated output power (P_{ra})	200 W	
Working temperature	0 ÷ +35℃	
Storage temperature	0 ÷ +45℃	
Relative humidity when working	20 ÷ 80% (without condensation)	
Relative humidity during storage	20 ÷ 95% (without condensation)	
Altitude (above sea level)	Up to 1000 m	
Indication	Sound / optical	
Fuses	Glass 5 x 20 mm 5 A Unival 19 mm 40 A	Unival 19 mm 40 A
POWER NETWORK SUPPLY		
Input voltage	~184 ÷ 264 V ± 2%	
Input voltage frequency	45 ÷ 55 Hz ± 1 Hz	
Output voltage range	~184 ÷ 264 V ± 2%	
Switching thresholds: mains- ups	~184 ÷ 264 V ± 2%	
Output voltage waveform	Sine	
Output voltage filtering	Anti-interference filter RFI-EMI / varistor muffler	
Time to switch to battery mode	< 3 ms	
BATTERY SUPPLY		
Output voltage (RMS)	~230 V ± 5%	
Output voltage waveform	Sine	
Switching thresholds: ups-mains	~189 V / ~259 V ± 2%	
Output voltage frequency	50 Hz ± 1 Hz	
Output voltage filtering	LC	
Short circuit protection	Electronic + fusible cut-out	
Overload protection	Electronic + fusible cut-out	
Time to switch to network mode	0 ms	
Power supply time - 1 battery module(100%/50% P_{ra})	1 h 50 min / 3 h 50 min	
Power supply time - 2 battery modules (100%/50% P_{ra})	3 h 50 min / 8 h	
Power supply time - 3 battery modules (100%/50% P_{ra})	6 h / 13 h	
Battery module batteries	6x VELA 12V / 7 Ah	
Battery module charging time: 42 Ah up to 90% of the capacity	10 h	
Maximum number of battery modules (42 Ah)	3 pieces	
Maximum capacity of external battery	150 Ah	
MECHANICAL PARAMETERS		
Dimensions (height x width x depth)	367 x 118 x 125 mm	367 x 209 x 119 mm
Weight	5.5 kg	17 kg
Working position	Wall-mounted or lying	
Transport position	Lying	

Note: The manufacturer reserves the right to change the above parameters without notice.

INFORMATION ON LEGAL PROVISIONS AND THE GUARANTEE

DECLARATION OF CONFORMITY

The power supply unit has been manufactured in Poland and its construction is in compliance with the provisions of the pertinent standards.

GUARANTEE

The guarantee for the appliance constitutes a separate document that is attached to the product. This document must meet all the formal requirements (e.g. date of sale, stamp of the seller).

The manufacturer has made every effort to ensure that the offered products are free of defects in materials and workmanship and remain so for the period of time set in the guarantee document. The liability of the company under the guarantee is limited to the repair or replacement of products containing such defects. The method of the removal of defects shall be determined by the manufacturer. The guarantee shall not cover appliances with mechanical damage that were improperly maintained or used, or that were modified in any way by the user.

EVER Sp. z o.o. does not provide any guarantees or warranties, including guarantees of fitness for sale or suitability for specific applications, in addition to the provisions of the guarantee card.

EVER Sp. z o.o. shall not be liable for any direct, indirect, extraordinary, coincidental, or consequential losses resulting from the usage of the power supply unit, even if notified of the possibility of such losses being incurred. The company shall not be held liable for any costs, such as the loss of profits or earnings, equipment, equipment usage, software, data, costs of replacement products, claims of third parties, or for any other costs whatsoever.